Ergonomics, Engineering, and Business: Repairing a Tricky Divorce

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Ergonomics, Engineering, and Business: Repairing a Tricky Divorce

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This paper discusses how the ergonomics community can contribute to make ergonomics a strategic element in business decisions on strategy and implementation of strategy. The ergonomics community is seen as a heterogeneous entity made up of educational and research activities in universities, ergonomists and engineers with ergonomic skills, professional ergonomics and engineering societies, and the complex of occupational health and safety regulation. This community interacts in different ways with companies and hereby influences how companies are dealing with ergonomics. The paper argues that desired influential effects on companies are dependent on a concurrent change within the community's different parts and their interaction with organizations and their surroundings.

INTRODUCTION

Ergonomists often complain not to participate in the right decisions in relation to designing and managing production systems. This leaves the ergonomists to do repair work of incomplete design of production facilities within severe economic constrains. This is an unfavourable situation not only from a health prevention perspective but also from an economic perspective. Most stakeholders associated with production systems have recognized this. Consequently Dul & Neumann (2009) has pointed out that in order to integrate ergonomics in business decision on strategy and implementation of strategy "…considerable changes must take place within the ergonomics research, education and practice community by moving from a health ergonomics paradigm to a business ergonomics paradigm, without losing the health and safety goals". Within this line of argument this paper addresses the question on how ergonomics can become a more strategic part of design and management of production systems and how ergonomists can add value to the company.

The authors of this paper have for more than 25 years been active within this type of research primarily in the Scandinavian countries. Based on a model of the relationships between organizations and the ergonomics community (Fig. 1), this empirical background is used to preliminary discuss: In what ways can this community contribute to the promotion of ergonomics as a strategic part of design and management of production systems?

The ergonomics community is seen as a heterogeneous entity made up of educational and research activities in universities and other institutions, ergonomists and engineers with different forms of ergonomics skills, professional ergonomics and engineering societies, and the complex of occupational health and safety (OHS) regulation. The ergonomics community may influence the activities of an organization or company in different ways. The OHS regulation sets up minimum requirements to the OHS standard and internal organization and procedures. Ergonomists may be employed in companies as OHS professionals, safety managers and the like. In Denmark ergonomists may have an educational background as engineer. Ergonomists may also be employed in the occupational health services, which in Denmark has been liberalized and now acts as private consultant firms. Ergonomists and engineers may be members of professional societies and associations aimed at developing their profession and promote knowledge sharing. In the universities and other institutions results from research in ergonomics may influence the companies and other part of the ergonomic community. The approach chosen to teach ergonomics may also influence the skills and ways of working for ergonomics practitioners and engineers.

Many factors influence a company in the way it deals with ergonomics as a strategic part of design and management of production systems. In this paper we will confine the discussion to the ergonomics community because this is where we are placed ourselves and hence we are looking for how this community can influence the companies.

OHS regulation is intended as a driver for preventive initiatives in designing production processes but in practice it might underpin the marginalization of ergonomics as described above. Hence, it is a challenge for ergonomists working in organizations to translate the implementation of regulation in a more strategic way. This takes skills in organizational politics pointing to the training and education of ergonomists. Because it is difficult for ergonomists to be part of formal groups formulating strategies for production development an alternative understanding of strategy as a reaction to the official statements made by top-management has to be applied as basis for developmental activities in organizations.

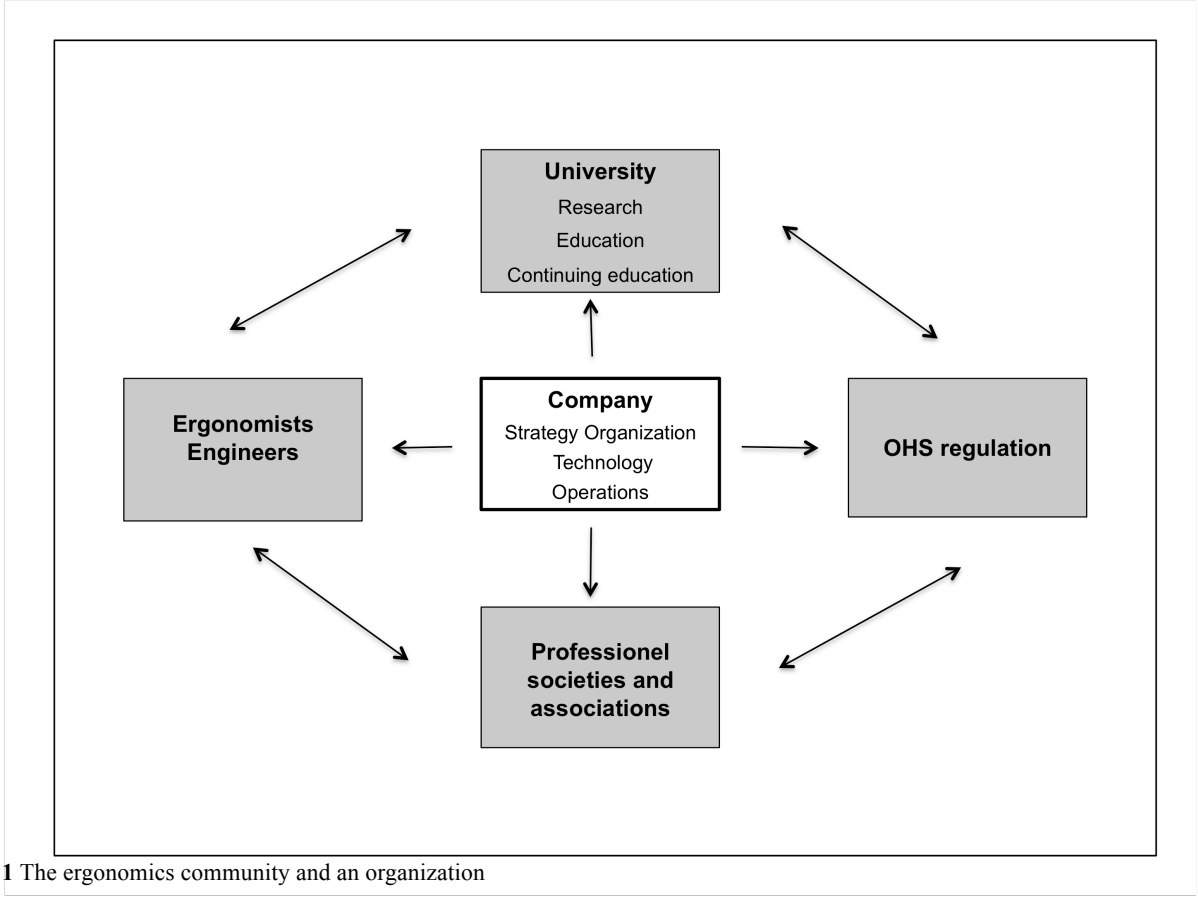

Figure 1 The ergonomics community and an organization

OHS REGULATION

Legislation forms legitimate base for the activities of (production-) egonomists in the Scandinavian countries. All countries have had legislation promoting support from specialists within the many different subjects within working environment. This concept covers both occupational health and safety and production ergonomics. As the legislation also emphasis the importance of preventive actions in handling work environment problems in enterprises it might be expected that such a platform should promote an approach integrating work environment into engineering and business decision making. Practical experience and research has shown that this does not take place. In most cases the issue of fulfilling legislative demands concerning work environment is 'delegated' to the mandatory safety organisation. These organisational units are typically affiliated to operations. Their primary source of information on the conditions of the work environment comes from operations either as complaints or through more formalised inspections. Their primary reference being operations the scope of actions is within the authority of operations managers. This implies that their focus primarily is on modifying production systems. These systems have typically been designed without taking into account the role of the operator. Therefore the scope of their suggestions is primarily repair of the existing production systems. This has been labelled 'the side-car function' both as a metaphor of the role of safety organisation and as a metaphor for priority ascribed to the field of work environment.

More legislative initiatives have been introduced to modify this situation. In Denmark especially legislation on workplace assessment (a Danish modification of the demand within the European Union to establish a procedure for local risk assessment) has been in focus. Studies show, that this has given the issues of work environment a higher priority in enterprises, but still leaving the theme in the 'side-car' focusing on repair activities of generally accepted problems. More complicated issues like psychosocial aspects of work and more complex ergonomic problems are neglected (Jensen 2001).

This situation has been analysed within more theoretical frames. An institutional approach (Powel & DiMaggio 1991) elaborates the findings by the concept of 'isomorphism'. This is defined as a similarity of processes between organisations. Enterprises might comply with legislative demands in more ways. Firstly, they might choose a strategy of coercive isomorphism, focusing on the fulfilling the formal specific demands formulated by the agencies enforcing the legislation. Secondly, they might choose a strategy of mimetic isomorphism, focusing on following the trendsetters within the field. Finally, they might choose a normative strategy, focusing on following the intention behind the legislation. According to theory this requires the employment of experts within the field.

ROLE OF ERGONOMISTS

The role of work environment as described has been addressed within the Danish community of work environment specialists and researchers. Through discussions of practice and experience combined with research an understanding of the qualifications required to develop work environment activities fulfilling the intentions behind legislation has

developed. Besides a basic knowledge in the traditional fields of ergonomics it takes skills in organizational politics to be able to meet the challenge to implement the demands and intentions in the regulation in a more strategic way. By introducing organizational politics in the syllabus concepts and theories can be introduced. Students are presented with a conceptual frame for handling important aspects of their professional life as ergonomists. Besides it opens for a more qualified reflection on experiences gathered both as a student and as a professional.

Dul & Neumann (2009) has argued that to get priority to ergonomics the ergonomists shall contribute directly to the company's strategy. They define:

…strategy as a combination of 'strategy concept' (the formulation of the course of action for reaching business goals) and 'strategy implementation' (realization of this concept) (Dul & Neumann 2009, p. 2)

The problem with this strategy it, that is difficult for ergonomists to be integrated in the formal groups formulating strategies for production development. Therefore the ergonomist must have an elaborated understanding of strategy. Mintzberg, Ahlstrand & Lampel (1998) offers such an understanding. They describe more approaches to strategy making distinguishing between deliberate strategies and emergent strategies. The deliberate strategies are strategies intended, while the emergent strategies are not expressly intended. They evolve over time by a combination of un-coordinated decisions, which converges over time to form a specific pattern: a strategy. Most often is difficult for ergonomists to participate in the formulation of major deliberate strategies even though they might have severe consequences for the working conditions in the enterprise. As examples can be mentioned strategies for the production structure and the production technology to be applied. Instead the ergonomist has opportunities to develop strategies (understood as a combined set of actions aligned towards realizing specific goals). Besides the ability to be a skilled 'political, reflective navigator' (Broberg & Hermund 2004) this demands an understanding of strategy beyond the dominating understanding of the concept. This has also to be addressed in basic education. Besides, it is important that such issues are addressed in the exchange of experience between professionals within the field. As a consequence the stock of strategies for the professional might develop.

EDUCATING ENGINEERS

It is a widespread idea in the ergonomics community that design engineers should have ergonomics training in their education and access to ergonomics tools in their work. In our experience, this is not an adequate strategy. Instead, design engineers should be taught that designing a production system is a process involving different stakeholders and perspectives. Hence, design engineers should be trained in methods to involve ergonomists and users in the design process. Ergonomists working in business organizations should promote the idea that management have to set up incentives for design engineers to include ergonomics aspects in the design process.

INTERACTION BETWEEN ACADEMIA, ERGONOMISTS AND COMPANIES

In Denmark the occupational health services (OHS) have played an important role for many companies in improving the work environment and the ways of handling ergonomics and work environment in the organization. The Workspace Design program (Broberg 2009) was an example of an interactive research approach that aimed to develop and transfer a new macro-ergonomic concept from academia to OHS consultants and companies. The idea was to develop the Workspace Design concept as a potential new service from OHS consultant firms that implied a new role for ergonomists working in these firms (Broberg, Seim & Andersen 2009).

The strategy chosen had two phases: In the "learning by participation" approach, the concept was developed and tested in an interactive research design, where the practitioners worked along side the researcher. At a later stage of the programme, after the concept has matured through the interactive process, the "learning by doing" approach can be applied. Both approaches acknowledge the social process of acquiring new knowledge and accentuate "learning" as an active process, instead of the more passive role awarded the student in a "teaching" situation.

The evaluation of the strategy chosen to "transfer" knowledge created in academia to practitioners in the Workspace Design programme has identified three factors that are essential for the learning process: 1) the interactive research set-up, where the practitioners are included in the research team and take part in the development, testing, and interpretation of results from applying the new concept to a real case in a company; 2) the possibility for the practitioners to practice the new concept in the normal consultancy setting and reflect upon their experiences with other consultants and researchers; and 3) the focus on the home organization of the practitioner, so the newly developed work practice is not only practiced by one, isolated consultant but becomes rooted in the local theory of the organization.

Besides the set up of learning processes for OHS consultants and company safety managers, the Workspace Design program used other approaches to spread and circulate the concept. This included workshops at the annual congress of work environment professionals in Denmark, meetings in the Society of Occupational and Health, a website, and popular reports and folders. The ultimate goal of this circulation strategy was to initiate a new discourse among professionals and thereby stimulate the development of new services that could place ergonomics and work environment in a more strategic position when companies were designing new production systems. In that way, it was an example of how to enrol different parts of the ergonomics community in a change of strategy.

CONCLUSION

The heterogeneous ergonomics community has to develop new strategies and methods within research, education, and practice. The desired influential effects on organizations are dependent on a concurrent change within the community's different parts and their interaction with organizations and

their surroundings. s

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